MULTIMEDIA UNIVERSITY

STUDENT ID NO

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# MULTIMEDIA UNIVERSITY

# FINAL EXAMINATION

**TRIMESTER 1, 2016/2017**

## TRS 2251 – ROUTING AND SWITCHING

(All Sections / Groups)

20 OCTOBER 2016
9.00 a.m. – 11.00 a.m.
(2 Hours)

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**INSTRUCTIONS TO STUDENTS**

1. This Question paper consists of 6 printed pages including cover page with 5 questions only.

2. Attempt **ALL** questions. Marks and the distribution of marks for each question is given.

3. Please write all your answer in the Answer Booklet provided.

**Question 1 [10 Marks]**

(a) For each device in the list below, briefly describe what the device does.

i. Repeater
ii. Bridge
iii. Router

[3 Marks]

(b) As the Thundercloud network administrator, you are required to have a firm understanding of the OSI model. Briefly describe the fourth layer of the OSI model.

[3 Marks]

(c) Define a broadcast domain and give an example of a device that separates each segment into different broadcast domains and provides connectivity between the segments.

[2 Marks]

(d) Internet Control Message Protocol (ICMP) is often used in troubleshooting and verifying the working of the network. Briefly identify **TWO** characteristics of the ICMP message.

[2 Marks]

**Question 2 [10 Marks]**

Thundercloud laboratory has been assigned with class C network: 192.1.1.0, and it wants to form subnets for 3 internal networks with the number of hosts as follows:

| | |
|---|---|
| Management Network: | 84 hosts |
| Data Network: | 56 hosts |
| Control Network: | 27 hosts |

(a) Provide a possible arrangement of the network address space, together with the respective range of IP addresses (subnet mask, network ID, first usable host address, last usable host address and broadcast address) for each subnet. Show your work.

[6 Marks]

(b) Based on the above requirement, propose a network design for that laboratory to make the communication between networks possible. Connect all the networks with star backbone topology. (Hint: You may use a router and 24-port managed switches in your design)

[3 Marks]

**Continued ...**

(c) While troubleshooting a connectivity issue from one of the hosts in above network, you obtain the following information:

Host IP address: 192.1.1.193
Subnet mask: 255.255.255.192
Default Gateway: 192.1.1.192
Remote Server: 192.1.1.2

You then conduct the following tests from that host:

Ping 127.0.0.1 – Successful
Ping 192.1.1.193 – Successful
Ping 192.1.1.192 – Unsuccessful
Ping 192.1.1.2 – Unsuccessful

What is the underlying cause of this problem?

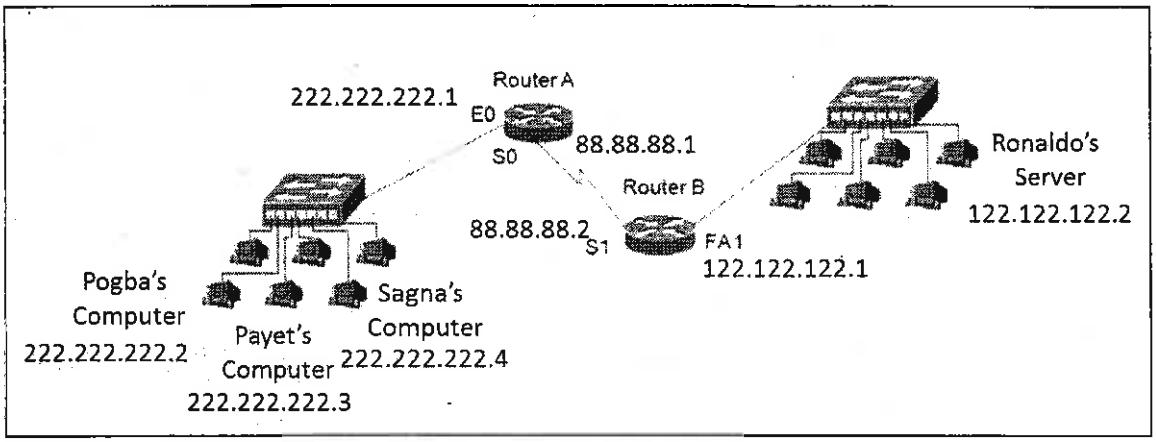
[1 Mark]

**Question 3 [10 Marks]**

(a) What are **TWO** reasons that Thundercloud network administrator would use access lists on a router?

[2 Marks]

(b) The topology of Thundercloud network is shown below:




i. Write a standard access list to block Pogba and Payet's computer from accessing to Ronaldo's server; but will allow all other traffic from the 222.222.222.0 network. Block all other traffic.

ii. On what interface and what direction the access list should be applied?

[3 + 2 = 5 Marks]

**Continued ...**

(c) An extended access list needs to be applied to a Thundercloud router. What **THREE** pieces of information can be used in an extended access list to filter traffic?

[3 Marks]

**Question 4 [10 Marks]**

(a) A Thundercloud router was configured as shown below:

*Router(config)# enable password portugal*
*Router(config)# enable secret france*
*Router(config)# line vty 0 4*
*Router(config-line)# password germany*
*Router(config-line)# login*
*Router(config-line)# exit*

A Thundercloud network administrator is connected to the router console port. After configuring the above commands, the administrator logs out and then logs back in at the console.

i. Which password does the administrator need to enter at the router prompt in order to get back into the privileged EXEC mode?
ii. Write down a command that is used to encrypt all the passwords available in the configuration file.

[1 + 1 = 2 Marks]

(b) What is the sequence of events when the Cisco router is powered up?

[2 Marks]

(c) Thundercloud Lab just purchased two new routers to start their cloud network. What are the items needed to establish a terminal session between a PC and the router for the initial configuration?

[3 Marks]

(d) Refer to the following exhibit.

**Continued ...**

```
Router> show version
Cisco Internetwork Operating System Software
IOS (tm) C2600 Software (C2600-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)
Technical Support: http://www.cisco.com/techsupport
Copyright (c) 1986-2005 by cisco Systems, Inc.
Compiled Wed 27-Apr-04 19:01 by miwang
Image text-base: 0x8000808C, data-base: 0x80A1F5CC

ROM: System Bootstrap, Version 12.1(3r)T2, RELEASE SOFTWARE (fc1)
Copyright (c) 2000 by cisco Systems, Inc.
ROM: C2600 Software (C2600-I-M), Version 12.2(28), RELEASE SOFTWARE (fc5)

System returned to ROM by reload
System image file is "flash:c2600-i-mz.122-28.bin"

cisco 2621 (MPC860) processor (revision 0x200) with 60416K/5120K bytes of memory


Processor board ID JAD05190MTZ (4292891496)
M860 processor: part number 0, mask 49
Bridging software.
X.25 software, Version 3.0.0.
2 FastEthernet/IEEE 802.3 interface(s)
2 Low-speed serial(sync/async) network interface(s)
32K bytes of non-volatile configuration memory.
16384K bytes of processor board System flash (Read/Write)

Configuration register is 0x2102

Router>
```

i. What is the total size of Random Access Memory (RAM)?

ii. What is the size of flash memory?

iii. The network administrator at Thundercloud Lab wants to upgrade the IOS of this router. The new IOS image requires 64 MB of RAM and 16 MB for storage of the file. Is it the router upgradeable?

[1 + 1 + 1 = 3 Marks]

**Question 5 [10 Marks]**

(a) How does a router learn about routes to a network?

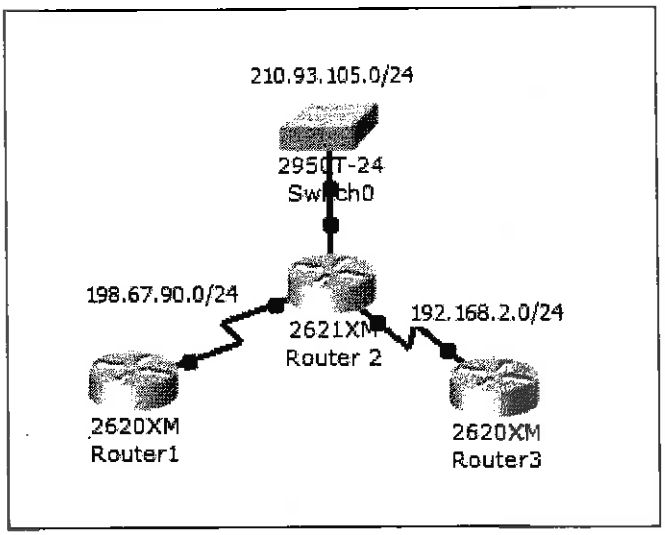
[3 Marks]

(b) What are the characteristics of link-state routing protocol?

[3 Marks]

**Continued ...**

(c)




The routers in the above exhibits receive routing updates every 30 seconds by default. Write a series of commands that needs to be configured in Router 2 in order to achieve this update interval..

*Router2(config)# ??*

[2 Marks]

(d) You work as a network administrator at Thundercloud Lab. After configuring two interfaces on Thundercloud router as shown below, you notice an error message. What should be done to fix this error?

```
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface fastethernet 0/0
Router(config-if)#ip address 192.168.1.17 255.255.255.0
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up
Router(config-if)#interface fastethernet 0/1
Router(config-if)#ip address 192.168.1.65 255.255.255.240
% 192.168.1.64 overlaps with FastEthernet0/0
Router(config-if)#
```

[2 Marks]

**End of Page**